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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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12/14/2005

Paul Joern

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FOUR SEAGATE - EIGHTH FLOOR
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EXAMINER

TOLIN, MICHAEL A

ART UNIT

PAPER NUMBER

1745

MAIL DATE

DELIVERY MODE

12/01/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/533,606	Applicant(s) JOERN, PAUL	
	Examiner MICHAEL A. TOLIN	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,8 and 9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,8 and 9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 22 October 2010 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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3. Claims 1-3, 8 and 9 are rejected under 35 U.S.C. 102(b,e) as being anticipated by Taggart (US 2002/0059976).

Taggart teaches a method for the production of a three-dimensional preform having a final three-dimensional target shape from textile starting materials, the three-dimensional preform having a desired fiber orientation and geometry. In the method of Taggart, a two dimensional bonded fabric is formed by laying textile starting materials two-dimensionally to form a stack which is subsequently subjected to heated rollers in order to bond the stack together into a two dimensional bonded fabric. The two dimensional bonded fabric is subsequently subjected to shaping and/or draping to form the final three dimensional target shape. The claimed shaping/draping step does not distinguish over the placement of the two dimensional fabric into a mold with subsequent shaping to conform the fabric to the mold and cover the mold. See Taggart (Abstract; Figures 3-5; paragraphs 6, 37-55, 60, 61 and 63). As to laying the textile starting materials with a back-calculated geometry and orientation, Taggart indicates that the process is fully automated with programming directly linked to three-dimensional part design software (paragraph 40). Taggart also indicates that this automation includes the formation of two dimensional plies having the desired geometry and orientation for subsequent shaping (paragraphs 43-48 and 50-52). In indicating that two dimensional plies having the desired geometry and orientation are automatically formed by use of a direct link to three-dimensional part design software, it is clear that the geometry and orientation have been back-calculated from the three-dimensional target shape and are laid to form the two dimensional bonded fabric

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according to the calculated geometry and orientation. As to the limitation of the fibers being movable with respect to each other (not definitely fixed in position) in steps b) and c), it is clear from the fact that the two dimensional fabric of Taggart is placed in a mold and conformed to the shape of the mold (paragraph 63) that the fibers are movable with respect to each other. As to placing the fibers in the desired orientation and geometry in step c), Taggart uses placement stations to dispense material in desired orientations and geometry based on data from three-dimensional part design software (paragraphs 40 and 43-48; Figure 3). Taggart subsequently places the two-dimensional preform in a mold and closes the mold to force the two-dimensional preform into the three-dimensional target shape (paragraph 63). The exemplary panel shown Figure 3 clearly would be placed in the mold in the proper orientation, or the desired orientation of the plies taught by Taggart would be lost. The claimed fixing is satisfied by the infusion of liquid matrix resin after shaping, which ultimately binds the reinforcing fibers of the fabric together to form the finished part (paragraph 63).

Regarding claim 2, Taggart clearly teaches compacting (paragraphs 54 and 55).

Regarding claim 3, Taggart suggests the use of tapes (paragraphs 38 and 50).

The limitations of claims 8 and 9 are clearly taught by Taggart (Figures 4 and 5; paragraph 38).

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Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taggart as applied to claims 1-3, 8 and 9 above.

The claims are rejected here in the alternative because Taggart does not explicitly recite that the shaping step includes placing the two-dimensional fabric in the desired orientation. As noted above, the desired orientation in the final part taught by Taggart (paragraphs 40 and 47-49) would be lost if the carefully produced two-dimensional fabric were not placed in the resin infusion mold with the desired orientation. To the extent that placing the two-dimensional fabric in the desired orientation into the mold is not implicit in Taggart, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide this limitation because one of ordinary skill in the art would have been motivated to ensure that the fiber orientation in the finished part is correct in accordance with the orientations calculated by software and produced by automated equipment as taught by Taggart.

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6. Claim 1-3, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taggart as applied to claims 1-3, 8 and 9 above, and further in view of either one of Wang (US 5038291) or Williamson (US 4534813), and further in view of any one of Cogburn (US 3995080), Cavallaro (US 5078396) or Marshall (US 4627791).

Since Taggart does not explicitly recite back-calculation of the geometry and fiber orientation of the textile materials which are to be laid up, the claims are rejected here in the alternative to show that one of ordinary skill in the art would have been motivated to provide such back-calculation.

With regard to back calculation of textile geometry, Wang teaches such back calculation in order to form accurate ply patterns in a short period of time using automated equipment (column 2, lines 5-61). Alternatively, Williamson teaches such back calculation in order to assure that flat plies will be laid up in their proper orientation in a composite structure and that such flat ply geometry may be determined by back calculation from a three-dimensional target (Abstract; column 2, lines 45-68; column 5, lines 15-25; column 7, lines 46-47; column 9, lines 19-21). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the claimed back calculation of geometry in the method of Taggart because one of ordinary skill in the art would have been motivated to achieve the above noted advantages in accordance with the teachings of either one of Wang or Williamson.

With regard to back calculation of textile orientation, Cogburn teaches that such back calculation should be provided in order to efficiently use the textile material in amounts and directions to accommodate primary and secondary loadings (column 1,

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lines 59-65; column 5, lines 40-68; column 6, lines 1-5; column 6, lines 63-68; column 7, lines 1-8; column 8, lines 24-28). Cavallaro teaches that such back calculation should be provided in order to determine ideal fiber orientations and percentages for achieving desired levels of bending, transverse and shear strengths (column 3, lines 6-20).

Marshall teaches that such back calculation should be provided using well known engineering techniques in order to ensure desired bending strength (column 3, lines 28-36; column 5, lines 6-20). Accordingly, it is clear from any one of Cogburn, Cavallaro or Marshall that one of ordinary skill in the art would have been motivated to provide the claimed back calculation of orientation in the method of Taggart in order to achieve the necessary strength or stiffness in various directions of the three-dimensional part. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the claimed back calculation of orientation in the method of Taggart because one of ordinary skill in the art would have been motivated to achieve the above noted advantages in accordance with any one of Cogburn, Cavallaro or Marshall.

Response to Arguments

7. Applicant's arguments filed 22 October 2010 have been fully considered but they are not persuasive.

Applicant argues step d) was added to specify that the fibers remain unfixed by the introduction of the binder. The examiner respectfully disagrees with this argument. Step d) in claim 1 explicitly recites that the textile starting material is fixed by the introduction of a binder.

Applicant argues that the thermal compaction step of Taggart fixes the fibers relative to each other. The examiner respectfully disagrees. Since the two-dimensional fabric of Taggart, after thermal compaction, can be subsequently shaped in a mold, it is clear that the fibers can move relative to each other. Such ability to move requires no more than a fabric which can drape or be shaped since fibers must move relative to each other in order to accomplish such shaping.

Applicant argues that paragraph 55 of Taggart discloses nothing about the motion of fibers relative to each other. However, the above noted shaping is clear from paragraph 63 of Taggart.

Applicant's arguments that Wang, Williamson, Cogburn, Cavallaro and Marshall fail to provide a teaching of the ability of the fibers to move relative to each other are not persuasive the reasons provided above. This limitation is satisfied by Taggart.

Applicant argues neither Wang nor Williamson described shaping a two-dimensional fabric to build a three-dimensional preform. However, such is clearly taught by the primary reference to Taggart. Wang and Williamson were relied upon in the alternative to show why one of ordinary skill in the art would have been motivated to back calculate geometry in the process of Taggart.

Applicant argues Cogburn, Marshall and Cavallaro are directed to tapes having fixed fibers. First, it is noted that flexible tapes have fibers which can move relative to each other. Further, the primary reference to Taggart was relied upon for building a two-dimensional fabric from plies having desired orientation and geometry and subsequently shaping the two-dimensional fabric into a three-dimensional target shape.

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Cogburn, Marshall and Cavallaro were relied upon in the alternative to show why one of ordinary skill in the art would have been motivated to back calculate orientation in the process of Taggart.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL A. TOLIN whose telephone number is (571)272-8633. The examiner can normally be reached on M-F 9am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Phillip Tucker can be reached on 571-272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael A Tolin/
Primary Examiner, Art Unit 1745